

* In Examiner Reference

Patent Claims

1. A microfocus X-ray tube for inspecting an object, comprising:

5 a head (6) that during operation of the X-ray tube faces an object that is to be inspected, wherein the head has an outer surface with a cross-section that tapers toward a free end of the head;

a target (8) disposed on or in said head (6); and

10 means for forming an electron beam adapted to bombard said target (8), wherein said means form said electron beam such that said X-ray tube has a focus with a diameter of $\leq 200 \mu\text{m}$.

2. A microfocus X-ray tube according to claim 1, wherein said focus has a diameter of the $\leq 10 \mu\text{m}$.

15 3. A microfocus X-ray tube according to claim 1, wherein said outer surface of said head (6) is essentially rotationally symmetrical.

4. A microfocus X-ray tube according to claim 3, wherein said outer surface of said head (6) is essentially conical.

5. A microfocus X-ray tube according to claim 1, wherein said outer surface of said head (6) terminates in a vertex.

20 6. A microfocus X-ray tube according to claim 1, wherein said outer surface of said head (6) is formed at least partially by said target (8).

7. A microfocus X-ray tube according to claim 1, wherein said outer surface of said head (6) is formed at least partially by a collimator (24) that in a direction of irradiation is disposed ahead of said target (8).

5 8. A microfocus X-ray tube according to claim 1, wherein said outer surface of said head (6) in a direction of irradiation, is formed at least partially by a holder (18) for said target (8).

9. A microfocus X-ray tube according to claim 4, wherein said essentially conical outer surface of said head (6) has an opening
10 angle of less than 50°.

10. A microfocus X-ray tube according to claim 4, wherein said head (6) is provided with at least two regions, disposed one after the other in an axial direction, having different opening angles of the conical outer surface.

15 11. A microfocus X-ray tube according to claim 1, wherein said target (8) is a transmission target.

12. A target for the X-ray tube of claim 1, wherein an outer surface (10) of said target (8) has a cross-section that tapers toward an end of said target that during operation of said X-ray tube faces an
20 object that is to be inspected.

13. A target according to claim 12, wherein said outer surface of said target (8) is essentially rotationally symmetrical.

14. A target according to claim 12, wherein said outer surface of said target (8) is essentially conical.

15. A target according to claim 12, wherein said outer surface of said target (8) terminates in a vertex (12)

5 16. A collimator for the target of said X-ray tube of claim 1, wherein an outer surface (28) of said collimator (24) has a cross-section that tapers toward an end of said collimator that during operation of said X-ray tube faces an object that is to be inspected.

10 17. A collimator according to claim 16, wherein said outer surface is essentially rotationally symmetrical.

18. A collimator according to claim 16, wherein said outer surface is essentially conical.

19. A collimator according to claim 16, wherein said outer surface terminates in a vertex.

15 20. A collimator according to claim 16, wherein said collimator (24) has a continuous opening (26) that extends in an irradiation direction of an X-ray beam.